

DD/A 80-1604/1

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MEMORANDUM FOR: Director of Research and Development, DDS&T

FROM: Don I. Wortman
Deputy Director for Administration

SUBJECT: Fiscal Year 1981 Exploratory Research Program

REFERENCE: Memo for DD/A fm D/ORD dtd 1 Jul 80, Subject:
ORD Research Program for FY-81

1. We received with pleasure your note concerning your 1981 research program. We look forward to helping you shape the exploratory research portion of that total program.

2. We have already devoted considerable thought to our exploratory research needs in 1981 and have identified eight areas that require the early and thoughtful attention of your research technologists. I think it appropriate that the attached listing of 1981 exploratory research requirements, shown in rank order, become a major focus in your upcoming discussions with the Directors of Data Processing and Security. I would ask that the same apply to our later discussions as well.

STATINTL

3. Please contact [REDACTED] extension [REDACTED] of my Management Staff STATINTL if he can be of assistance in this matter.

/ William N. Hart

Don I. Wortman

Attachment:
A/S

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11 Jul 80
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Directorate of Administration
FY 1981 Exploratory Research Requirements
(In Rank Order)

1. Security Filtering Technology for Community Access to Agency Databases

This project involves the use of "provably secure" software to act as an interface between Agency software and non-Agency Intelligence Community terminal users. The filter would prevent inappropriate requests from being executed and would ensure that originator controlled information would not pass outside of the Agency. This project would be undertaken on behalf of the Intelligence Community Resource Management Office and may possibly benefit from some Community funding. (U)

(Submitted by the Office of Data Processing)

2. Data Encryption Techniques for Data Stored on Magnetic Media

This project would explore technical means for encryption of computer stored data. The technique would be used in field applications, such as CRAFT, and the Class A Financial System, to avoid compromise of data without the need to destroy disks and tapes. Encryption also has applicability in preventing spillage problems, where inadvertent spillage to a terminal without the appropriate key would appear scrambled.

This study would develop fundamental algorithms for storing and retrieving data, as well as implementation procedures, and would address the potential for using the techniques, with an analysis of the cost and operational advantages and disadvantages of using them. (U)

(Submitted jointly by the Offices of Data Processing and Security)

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3. Optical Systems

Recent (FY-80) USG losses of optical collection system hardware has forced the need to accelerate previously programmed and ongoing activities addressing the detection of hostile audio optical systems. Additional impetus is derived from the knowledge that the unique physical construction of these lost systems was continually modified until it was no longer detectable by the countermeasures equipment currently in use throughout the Community.

Preliminary descriptions and demonstrations of currently developing optical detection system hardware indicates a need for near future consideration of realistic, practical user scenarios. The current phase of research and development properly addresses the optical source spectral identification and a precise spatial location capability. The operating environment for this feasibility phase requires several hours per sequence, stringent physical stability for the collector optics, and 20 to 40 cubic feet of hardware at the collection site.

The future, realistic operational scenario will require less than 3 minutes' curb-side time for collection, large area scan as near as 20 feet away, allow near-real-time data processing, and allow the data to be collected in a hand-held procedure. The system must be rugged and transportable, and the collector optics will be portable and possibly camouflaged.

A functional option not presently being considered will include information processing that will obviate by detection or demodulation the instances of audio source format.

Because of the aforementioned losses and the fact that the Optical Threat was not properly funded or addressed in the past, we feel it is imperative that FY-81 funds be made available to put this countermeasures program back on track with the positive collection technology available to the opposition. (S)

(Submitted by the Office of Security)

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4. Text Search

The 1982 R&D program includes money for development of text searching capabilities. This suggested exploratory program would involve fundamental aspects of the development program which should be determined prior to FY-82. Included in this are the potential application of finite state software (or microcode) based on the ORD developed High Speed Text Search machine, as well as potential hardware enhancements which might result in applying these techniques to a disk controller. This project has general applicability to ODP customers. (U)

(Submitted by the Office of Data Processing)

5. Bandwidth Compression Techniques

This project would address the general problem of effective utilization of bandwidth constrained communications, such as will be typical of the overseas environment. Fundamental exploration of compression techniques and their relevance to expected modes of overseas communications, such as support for computer terminals, would be determined. This project would be of significant benefit to both ODP and OC customers, and its inclusion here has been coordinated with the Office of Communications. (U)



6. Fiber Optics for Transmission

(Submitted Jointly by the Offices of Data Processing and Communications)

The Agency is becoming heavily involved in systems for retrieval and communications of images, such as ODP's ADSTAR. The communications bandwidth requirements for remote distribution of images are such that these applications could significantly benefit from the use of fiber optic technology. We need an exploration into the overall technology and into the image application in particular. Specific aspects for study would include multiple access considerations and interfaces to other communications media. (U)

(Submitted by the Office of Data Processing)

7. Improvement of High Frequency Communications

Implentation of an improved high frequency

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communications technique is of great importance to assured, reliable communications in emergency situations. Inclusion of work on this effort within the protected portion of the FY 1982 Clandestine R'D decision unit notwithstanding, and Exploratory Research funding in FY 1981 would enhance the value of developmental work undertaken in FY 1982 and reduce lead times for ultimate deployment. (S)

(Submitted by the Office of Communications)

8. Office Machine Protection

Previous years of R&D efforts and funds have been directed to identifying and describing the significant security problem areas of office machines. It is important that efforts now be directed to ranking these vulnerabilities, being mindful of relative quantities of each machine deployed. The logical step is to develop procedures for detecting or evaluating these vulnerabilities in the field. The natural final phase would address the corrective action required to correct problem units/systems. Internal or integral hardware alterations of deployed and operating equipment must be considered. Environmental improvements such as shielding (booths) for emanations or acoustics may be indicated.

The recent Intelligence Community concerns with MUTS type signal activity has highlighted this area of possible vulnerability that has been poorly addressed in past R&D efforts. We find ourselves with many technical questions and no data on which to base decisions or formulate policy. The use of FY-81 funds to further investigate the Office Machine problem is of the utmost importance as we approach an era of the "paperless society." (S)

(Submitted by the Office of Security)

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Phil - I appreciate your effort to solicit our views. I look forward to our session in which I will be joined by B [redacted] that!

ORD-873-80
JUL 1980

STATINTL

MEMORANDUM FOR: Deputy Director for Administration

FROM: Philip K. Eckman
Director of Research and Development

SUBJECT: ORD Research Program for FY-81

Don

10 JUL 1980

1. In early September, I will be meeting with Les Dirks to review my proposed research program for the next fiscal year.
2. Prior to then, I plan to meet with the Directors of Security and of Data Processing, and then you, to discuss that program.
3. Within the next three weeks, I will be in touch again to schedule those meetings.

Phil
Philip K. Eckman

cc: D/Sec
D/ODP

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